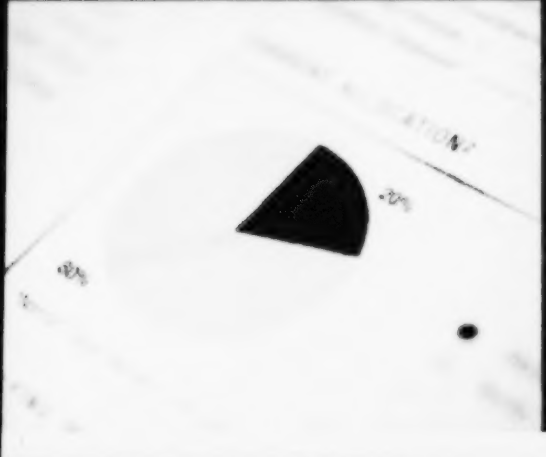


Alberta's Supply Outlook Model: Education and Skills, 2007-2017

Alberta Employment, Immigration and Industry

2008-02137/

Highlights

- The proportion of Albertans with a post-secondary education is expected to increase from 48.8% to 52.5% over the forecast period of 2007 to 2017.
- More females than males, 55.8% compared to 49.3%, are expected to have obtained a post-secondary education by 2017.
- There will be more people who have graduated from the fields of education, humanities, social sciences, engineering, and mathematical and computer sciences at the university level than from college and trade institutions.
- It is expected that there will be more Albertans with fine arts, commerce, applied sciences and health professions qualifications at the college and trade level than the university level.
- At the college and trade level a higher percentage of males than of females will have qualifications in the applied science technologies and trades field. Females are expected to have higher percentages with education, commerce, arts, social sciences, and health qualifications.
- Of those Albertans with university degrees, females are more likely than males to have studied in education and health fields. Males are more likely to have engineering and mathematical and computer sciences qualifications.
- Ways of attracting people of the non-traditional gender into trades and health fields of study should be looked at to help ease potential labour shortages.

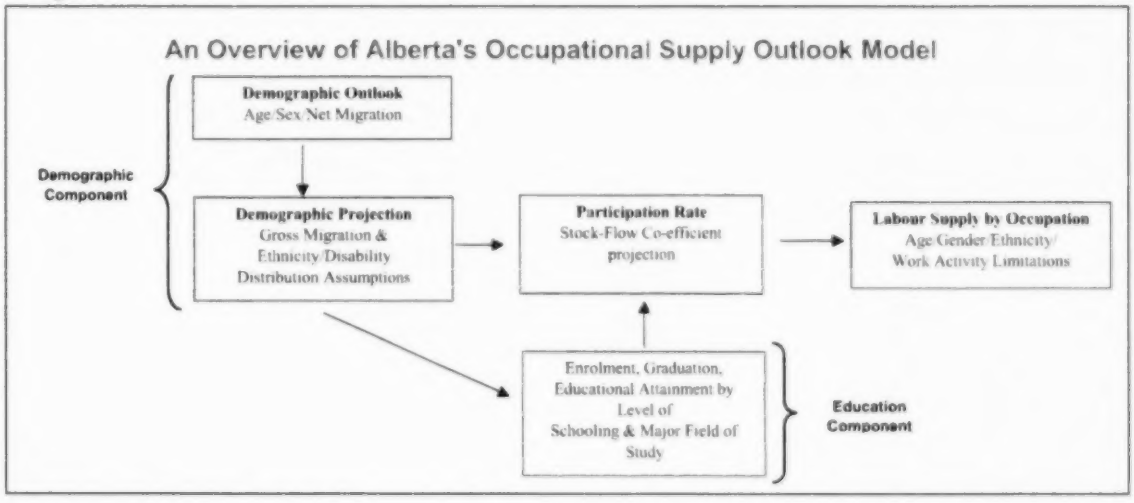
Introduction

Each year Alberta Employment, Immigration and Industry (EII) produces Alberta's Occupational Supply Outlook Model (AOSOM)[1]. The AOSOM provides labour supply forecasts for 140 occupational groups covering a 10-year forecast period. The model contains 30 linked sub-models and more than 100,000 data series.

The education sub-model is a critical component of the AOSOM. The model forecasts the number of enrolments and graduates across eleven major fields of study, listed in Appendix A, for different levels of schooling. These forecasts can be translated into the occupations where these people are expected to look for employment. Figure 1 provides an overview of the AOSOM and the role of the education component in forecasting labour supply.

The first section of the report looks at the projected educational attainment levels of Alberta's population. The remainder of the report gives an analysis of the major fields of study at different post-secondary education levels and by gender. Following the text, Appendix B details the assumptions underlying the education forecasts and Appendix C shows the results of the model projections.

Figure 1

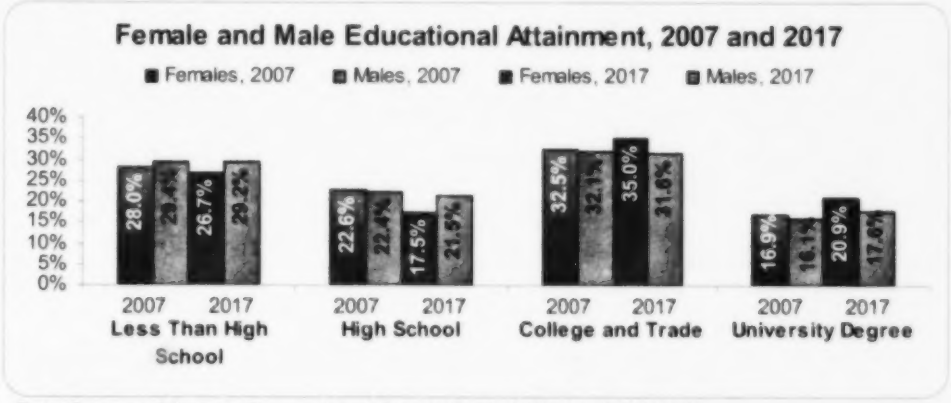


[1] See http://employment.alberta.ca/cps/rde/xchg/hre/hs.xsl/2656.html for more reports on Alberta's Occupational Supply Outlook

Educational Attainment

Over the forecast period of 2007 to 2017, the proportion of people with a post-secondary education is expected to increase from 48.8% to 52.5%. Meanwhile, the other categories, less than high school and high school, are expected to decrease. Chart 1 compares the proportion of each gender projected to have attained each level of education in 2007 and 2017. It is expected that females will have larger proportions with post-secondary education in 2017 than males, 55.8% compared to 49.3%.

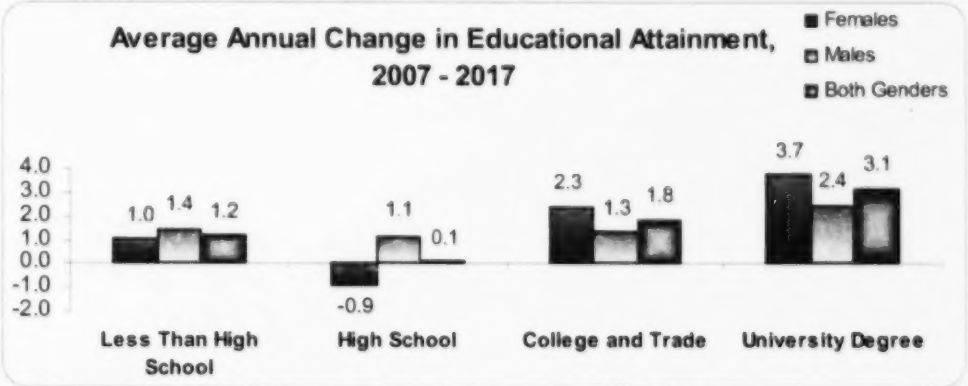
Chart 1



Data Source: Alberta's Occupational Supply Outlook Model, 2007-2017

Chart 2 shows the average annual change in educational attainment between 2007 and 2017 for males, females, and for both genders. While the university degree attainment level shows the highest average annual change with 3.1%, high school has the lowest at 0.1% per year. Females are expected to have higher growth rates than males for post-secondary levels of attainment, and lower for high school and less than high school attainment levels. These changes are the result of an increase in post-secondary enrolment rates over the forecast period, particularly for females.

Chart 2



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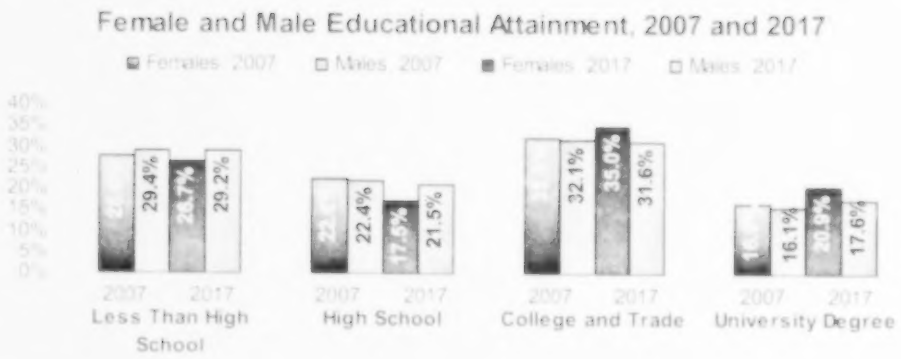

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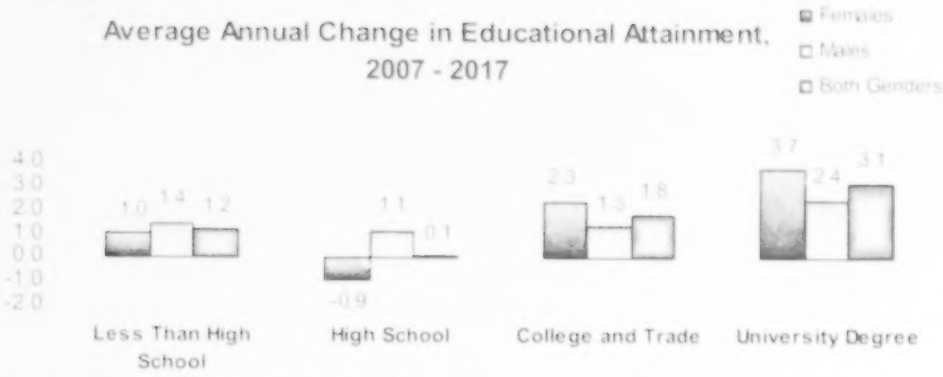
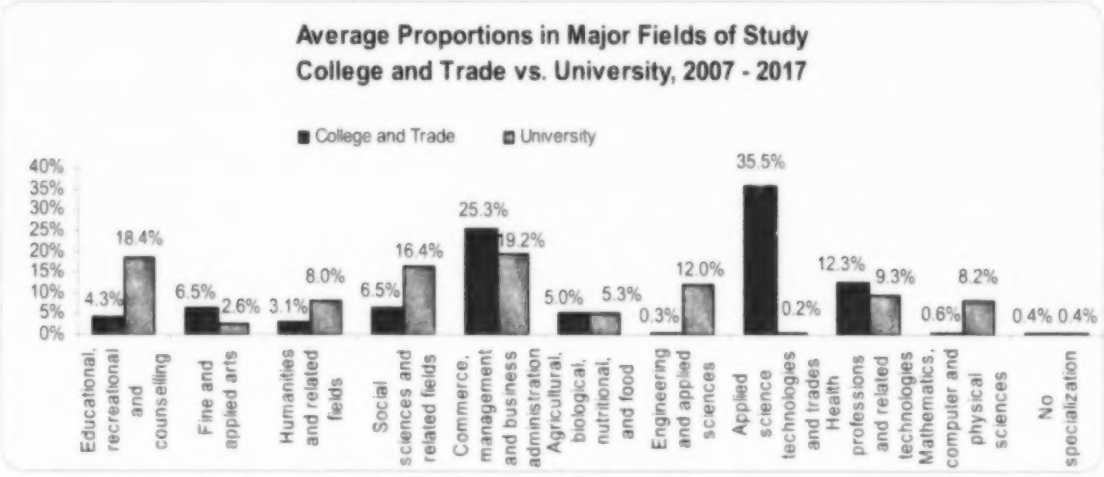


Data Source: Alberta's Occupational Supply Outlook Model, 2007-2017

Major Fields of Study: College vs. University

Chart 3 compares the average proportions in each major field of study between college and trade and university levels of educational attainment. There are certain major fields of study that have different representations at the college and trade level than at the university level. There are higher proportions with education, humanities, social sciences, engineering, and mathematical and computer sciences qualifications from universities than from college and trade institutions. On the other hand, there are larger proportions with fine arts, commerce, applied sciences, and health professions qualifications at the college and trade level than at the university level. The only major fields of study where the proportions are similar between college and trade and university are agricultural, biological, nutritional, and food sciences.

Chart 3



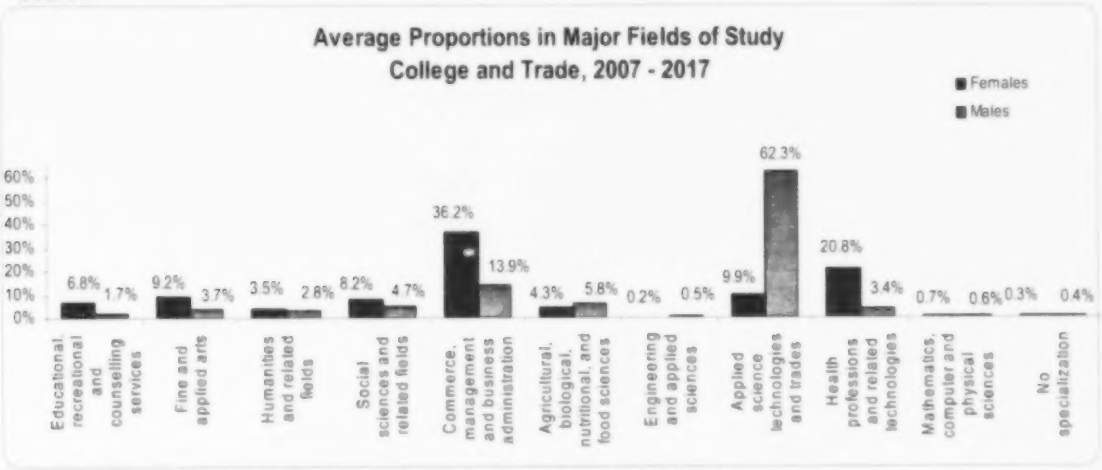
Data Source: Alberta's Occupational Supply Outlook Model, 2007-2017

These differences are likely due to the differences in degree and diploma programs offered by college and trade institutions compared with universities. These differences remain similar over the forecast period of 2007 to 2017, as there are no significant changes in the proportions at either educational attainment level over the period.

Major Fields of Study: College and Trade

Chart 4 compares the average proportions over the forecast period 2007 to 2017 of all college and trade graduates in each major field of study by gender. There are higher proportions of females than males with qualifications in most major fields of study, except for applied science technologies and trades, with 62.3% of males compared to 9.9% of females. Females have larger proportions with education, commerce, arts, social sciences, and health qualifications.

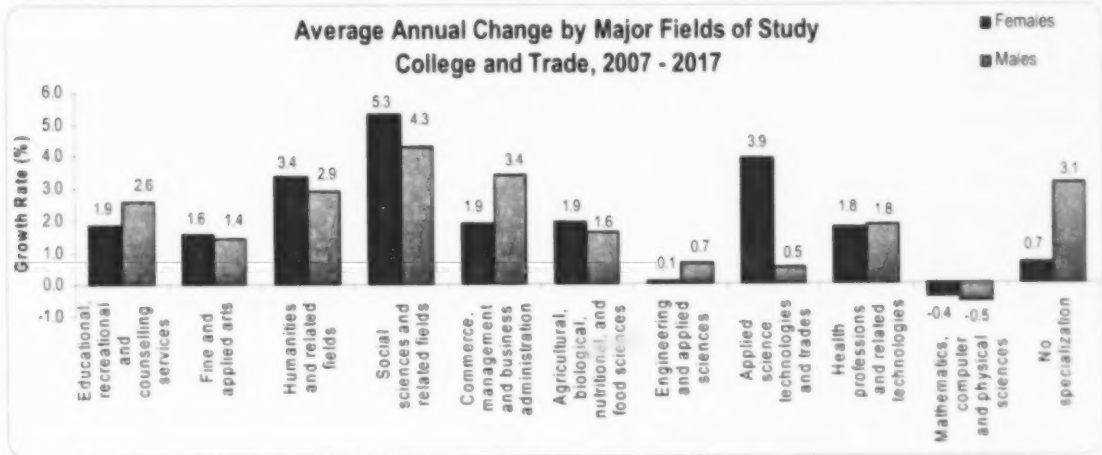
Chart 4



Data Source: Alberta's Occupational Supply Outlook Model, 2007-2017

Chart 5 shows the average annual growth rates for males and females in each major field of study over the forecast period 2007 to 2017. Males are anticipated to have higher growth rates than females in commerce, education, and engineering. Females are expected to have higher growth rates in applied and social sciences.

Chart 5

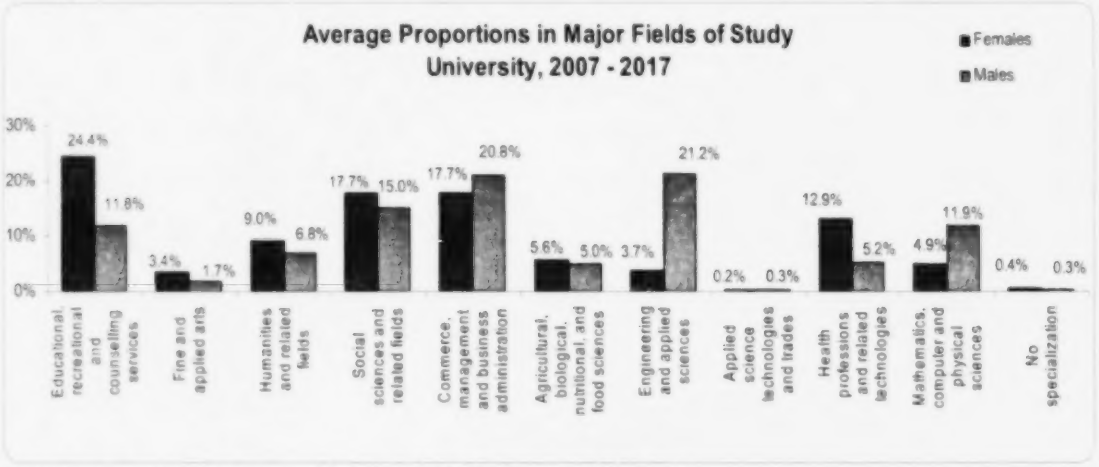


Data Source: Alberta's Occupational Supply Outlook Model, 2007-2017

Major Fields of Study: University

Chart 6 shows the average proportions over the forecast period of 2007 to 2017 of all university graduates in each major field of study by gender. A higher proportion of females than males are expected to have qualifications in education, arts, humanities, social sciences, and health fields of study. Males have higher proportions with commerce, engineering, and mathematical and computer sciences qualifications. These are the fields that have traditionally been dominated by one gender or the other.

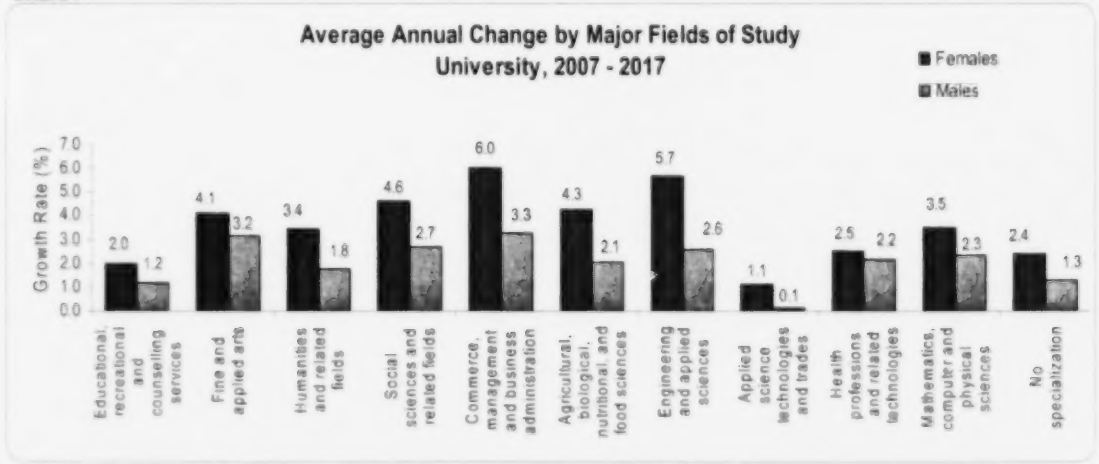
Chart 6



Data Source: Alberta's Occupational Supply Outlook Model, 2007-2017

According to Chart 7, females have higher average annual growth rates than males for all of the major fields of study over the forecast period of 2007 to 2017. This is because the enrolment rates for females are expected to increase at a faster rate than for males over the forecast period.

Chart 7



Data Source: Alberta's Occupational Supply Outlook Model, 2007-2017

Summary and Conclusion

Over the coming decade, 2007 to 2017, the overall level of educational attainment in Alberta is expected to increase as more people enroll in post-secondary institutions. It is anticipated that the enrolment rates of post-secondary education for females will increase more over the forecast period than for males, resulting in a higher proportion of females having obtained a post-secondary education.

There are many differences between what types of diplomas and degrees post-secondary graduates are receiving according to what type of institution they have attended. Males have a higher proportion than females with qualifications in applied science technologies and trades at both educational attainment levels; however, females are expected to have high average annual growth rates in this field over the forecast period. On the other hand, females have higher proportions with qualifications in health from both types of institutions.

According to Alberta's Occupational Demand and Supply Outlook, 2007-2017[2] occupations related to the trades and health major fields of study are expected to be in need of labour over the coming decade. Therefore, ways of attracting people of the non-traditional gender into these fields of study could be looked at to help ease potential labour shortages.

[2] **Available at** http://employment.alberta.ca/documents/LMI/LMI-LMF_occ_demand_supply.pdf

Major Fields of Study

- Educational, recreational, and counseling services
- Fine and applied arts
- Humanities and related fields
- Social sciences and related fields
- Commerce, management and business administration
- Agricultural, biological, nutritional, and food sciences
- Engineering and applied sciences
- Applied science technologies and trades
- Health professions and related technologies
- Mathematics, computer, and physical sciences
- No specialization

Education Assumptions

A number of assumptions are used to derive the results of this forecast. The assumptions used to generate the results in Appendix C are described below.

Enrolment and Graduation

- The number of people who attend school is calculated as a share of the total number in that age or gender group. This proportion is based on historic shares.
- The secondary school enrolment rate for males and females remains constant over the projection period.
- Enrolment rates for post-secondary institutions increase at the same rate as the average of the high and low enrolment rate projections that were conducted by Alberta Advanced Education and Technology.
- Graduation rates are determined by level of schooling, major field of study, age and gender. Graduation rates are calculated as a share of those who could potentially graduate and are kept constant over the forecast period.
- The overall number of university, college and trades graduates is determined by applying the graduate rate to the different age groups who are enrolled in that institution and could potentially graduate.
- Drop-out rates and mature student rates are used for the different major fields of study and level of schooling.
- Migration rates by educational attainment are allowed to adjust to reflect relative demand conditions in Alberta.

Educational Attainment

- To calculate the number of people with university, college and trades, and high school education, a stock-flow approach[3] was used.

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[3] Stock-Flow Approach: A method in estimating the future population of people in a group of interest. To find the forecasted population, the population from the previous year is adjusted to add those expected to enter that group and subtract those that are expected to leave that group. Example:

Number of people with College/Trades Training $_{t+1}$	=	Number of people with College/Trades Training $_{t}$	plus	Recent Graduates of College/Trades $_{t+1}$	minus	People Leaving Group due to death, retirement, etc. $_{t+1}$

- Those with less than a high school education are determined to be those not already accounted for in other educational attainment categories.
- Less than high school educational attainment is adjusted to reflect the estimated portion of mature students in post-secondary institutions that do not have a high school diploma. High school educational attainment is also adjusted to subtract recent graduates from university and college and trades.
- The overall enrolment rate for mature students is used for all age groups within the mature student category.
- To project educational attainment by major field of study, the historic relative enrolment rate is maintained over the projected period.
- The share of new graduates by major field of study is constant over time.
- University transfer programs are included as university enrollment and university certificates are classified as college and technical.
- Educational attainment is based on the new graduate forecast plus net inflows from migration less deaths.

Educational Attainment

Both Genders	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average, 2007-2017
Less Than High School	803,995	818,233	830,831	843,039	852,727	857,937	862,648	867,659	875,894	886,463	898,958	
% of Total	28.7%	28.5%	28.4%	28.4%	28.3%	28.2%	28.0%	27.9%	27.8%	27.9%	28.0%	
Growth Rate (%)	2.30	1.77	1.54	1.47	1.15	0.61	0.55	0.58	0.95	1.21	1.41	1.23
High School	630,224	640,490	647,187	650,150	650,554	649,641	647,787	645,028	640,330	633,607	626,306	
% of Total	22.5%	22.3%	22.1%	21.9%	21.6%	21.3%	21.0%	20.7%	20.3%	19.9%	19.5%	
Growth Rate (%)	1.94	1.63	1.05	0.46	0.06	-0.14	-0.29	-0.43	-0.73	-1.05	-1.15	0.12
College and Trade	904,275	927,159	947,003	964,008	979,649	995,257	1,011,155	1,027,243	1,042,319	1,056,242	1,070,523	
% of Total	32.3%	32.3%	32.4%	32.4%	32.5%	32.7%	32.8%	33.0%	33.1%	33.2%	33.3%	
Growth Rate (%)	3.14	2.53	2.14	1.80	1.62	1.59	1.60	1.59	1.47	1.34	1.35	1.83
University Degree	461,996	480,847	497,906	513,686	528,885	544,094	559,449	574,870	589,716	603,895	618,162	
% of Total	16.5%	16.8%	17.0%	17.3%	17.6%	17.9%	18.2%	18.5%	18.7%	19.0%	19.2%	
Growth Rate (%)	4.65	4.08	3.55	3.17	2.96	2.88	2.82	2.76	2.58	2.40	2.36	3.11

Females	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average, 2007-2017
Less Than High School	390,166	395,673	400,487	405,330	409,035	410,445	411,985	413,448	416,862	421,727	427,498	
% of Total	28.0%	27.8%	27.5%	27.4%	27.3%	27.1%	26.9%	26.7%	26.6%	26.6%	26.7%	
Growth Rate (%)	1.85	1.41	1.22	1.21	0.91	0.34	0.38	0.36	0.83	1.17	1.37	1.00
High School	314,629	316,897	317,283	315,631	312,566	308,769	304,429	299,595	293,712	286,764	279,534	
% of Total	22.6%	22.2%	21.8%	21.4%	20.9%	20.4%	19.9%	19.3%	18.7%	18.1%	17.5%	
Growth Rate (%)	0.76	0.72	0.12	-0.52	-0.97	-1.21	-1.41	-1.59	-1.96	-2.37	-2.52	-1.00
College and Trade	452,134	466,089	478,484	489,417	499,680	509,957	520,408	530,984	541,065	550,569	560,270	
% of Total	32.5%	32.7%	32.9%	33.1%	33.4%	33.6%	33.9%	34.3%	34.5%	34.8%	35.0%	
Growth Rate (%)	3.97	3.09	2.66	2.28	2.10	2.06	2.05	2.03	1.90	1.76	1.76	2.33
University Degree	235,584	247,031	257,507	267,365	276,964	286,595	296,326	306,112	315,602	324,739	333,931	
% of Total	16.9%	17.3%	17.7%	18.1%	18.5%	18.9%	19.3%	19.7%	20.1%	20.5%	20.9%	
Growth Rate (%)	5.54	4.86	4.24	3.83	3.59	3.48	3.40	3.30	3.10	2.90	2.83	3.73

Males	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average, 2007-2017
Less Than High School	413,828	422,560	430,344	437,710	443,692	447,492	450,663	454,210	459,032	464,736	471,459	
% of Total	29.4%	29.3%	29.3%	29.3%	29.3%	29.2%	29.1%	29.0%	29.0%	29.1%	29.2%	
Growth Rate (%)	2.72	2.11	1.84	1.71	1.37	0.86	0.71	0.79	1.06	1.24	1.45	1.44
High School	315,595	323,593	329,904	334,519	337,988	340,872	343,358	345,432	346,618	346,842	346,772	
% of Total	22.4%	22.5%	22.5%	22.4%	22.3%	22.3%	22.2%	22.1%	21.9%	21.7%	21.5%	
Growth Rate (%)	3.14	2.53	1.95	1.40	1.04	0.85	0.73	0.60	0.34	0.06	-0.02	1.15
College and Trade	452,141	461,070	468,519	474,592	479,968	485,300	490,747	496,259	501,254	505,673	510,253	
% of Total	32.1%	32.0%	31.9%	31.8%	31.7%	31.7%	31.7%	31.7%	31.7%	31.7%	31.6%	
Growth Rate (%)	2.33	1.97	1.62	1.30	1.13	1.11	1.12	1.12	1.01	0.88	0.91	1.32
University Degree	226,412	233,816	240,399	246,321	251,921	257,499	263,123	268,758	274,114	279,156	284,231	
% of Total	16.1%	16.2%	16.4%	16.5%	16.6%	16.8%	17.0%	17.2%	17.3%	17.5%	17.6%	
Growth Rate (%)	3.75	3.27	2.82	2.46	2.27	2.21	2.18	2.14	1.99	1.84	1.82	2.43

Appendix C

Major Fields of Study: College and Trade

Both Genders	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average, 2007-2017
Educational, recreational and counselling services	38,828	39,950	40,914	41,730	42,473	43,211	43,963	44,723	45,431	46,077	46,741	
% of Total	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.4%	4.4%	4.4%	4.4%	
Growth Rate (%)	3.36	2.89	2.41	1.99	1.78	1.74	1.74	1.73	1.58	1.42	1.44	2.01
Fine and applied arts	59,824	61,245	62,412	63,325	64,130	64,931	65,754	66,593	67,351	68,019	68,715	
% of Total	6.6%	6.6%	6.6%	6.6%	6.5%	6.5%	6.5%	6.5%	6.5%	6.4%	6.4%	
Growth Rate (%)	3.07	2.38	1.91	1.46	1.27	1.25	1.27	1.28	1.14	0.99	1.02	1.55
Humanities and related fields	26,601	27,772	28,823	29,742	30,601	31,450	32,303	33,155	33,961	34,715	35,476	
% of Total	2.9%	3.0%	3.0%	3.1%	3.1%	3.2%	3.2%	3.2%	3.3%	3.3%	3.3%	
Growth Rate (%)	5.63	4.40	3.78	3.19	2.89	2.77	2.71	2.64	2.43	2.22	2.19	3.17
Social sciences and related fields	50,106	53,328	56,362	59,216	61,988	64,760	67,549	70,346	73,071	75,713	78,373	
% of Total	5.5%	5.8%	6.0%	6.1%	6.3%	6.5%	6.7%	6.8%	7.0%	7.2%	7.3%	
Growth Rate (%)	8.59	6.43	5.69	5.06	4.68	4.47	4.31	4.14	3.87	3.62	3.51	4.94
Commerce, management and business administration	223,388	230,287	236,433	241,878	246,975	252,057	257,204	262,392	267,321	271,956	276,675	
% of Total	24.7%	24.8%	25.0%	25.1%	25.2%	25.3%	25.4%	25.5%	25.6%	25.7%	25.8%	
Growth Rate (%)	3.71	3.09	2.67	2.30	2.11	2.06	2.04	2.02	1.88	1.73	1.74	2.30
Agricultural, biological, nutritional, and food sciences	45,573	46,674	47,633	48,460	49,223	49,984	50,759	51,543	52,277	52,954	53,646	
% of Total	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	
Growth Rate (%)	2.91	2.42	2.05	1.74	1.57	1.55	1.55	1.54	1.42	1.30	1.31	1.76
Engineering and applied sciences	3,357	3,394	3,422	3,440	3,453	3,465	3,477	3,488	3,496	3,500	3,504	
% of Total	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	
Growth Rate (%)	1.42	1.10	0.82	0.53	0.38	0.35	0.35	0.32	0.23	0.11	0.11	0.52
Applied science technologies and trades	334,821	340,185	344,441	347,657	350,343	352,977	355,678	358,413	360,765	362,689	364,721	
% of Total	37.0%	36.7%	36.4%	36.1%	35.8%	35.5%	35.2%	34.9%	34.6%	34.3%	34.1%	
Growth Rate (%)	2.06	1.60	1.25	0.93	0.77	0.75	0.77	0.77	0.66	0.53	0.56	0.97
Health professions and related technologies	112,049	114,516	116,696	118,652	120,524	122,453	124,465	126,550	128,577	130,526	132,556	
% of Total	12.4%	12.4%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.4%	12.4%	
Growth Rate (%)	2.70	2.20	1.90	1.68	1.58	1.60	1.64	1.68	1.60	1.52	1.56	1.79
Mathematics, computer and physical sciences	6,359	6,357	6,340	6,309	6,270	6,230	6,192	6,154	6,112	6,064	6,018	
% of Total	0.7%	0.7%	0.7%	0.7%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	
Growth Rate (%)	0.24	-0.03	-0.27	-0.49	-0.62	-0.64	-0.61	-0.61	-0.68	-0.79	-0.76	-0.48
No specialization	3,371	3,451	3,527	3,598	3,668	3,739	3,811	3,885	3,957	4,028	4,099	
% of Total	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	
Growth Rate (%)	2.28	2.37	2.20	2.01	1.95	1.94	1.93	1.94	1.85	1.79	1.76	2.00

Appendix C

Major Fields of Study: College and Trade (Cont.)

Females		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average, 2007-2017
Educational, recreational and	**d counselling services**	31,580	32,446	33,177	33,785	34,332	34,874	35,427	35,989	36,506	36,974	37,456	
% of Total		7.0%	7.0%	6.9%	6.9%	6.9%	6.8%	6.8%	6.8%	6.7%	6.7%	6.7%	
Growth Rate (%)		3.31	2.74	2.25	1.83	1.62	1.58	1.59	1.59	1.44	1.28	1.30	1.87
Fine and applied arts		43,085	44,141	45,005	45,673	46,261	46,846	47,449	48,064	48,621	49,110	49,622	
% of Total		9.5%	9.5%	9.4%	9.3%	9.3%	9.2%	9.1%	9.1%	9.0%	8.9%	8.9%	
Growth Rate (%)		3.24	2.45	1.96	1.48	1.29	1.26	1.29	1.30	1.16	1.01	1.04	1.59
Humanities and related fields	**s**	14,870	15,567	16,193	16,737	17,247	17,751	18,258	18,763	19,243	19,693	20,147	
% of Total		3.3%	3.3%	3.4%	3.4%	3.5%	3.5%	3.5%	3.5%	3.6%	3.6%	3.6%	
Growth Rate (%)		6.10	4.69	4.02	3.36	3.05	2.92	2.86	2.77	2.56	2.34	2.31	3.36
Social sciences and related fi	**fields**	31,958	34,134	36,195	38,147	40,051	41,957	43,877	45,804	47,688	49,523	51,368	
% of Total		7.1%	7.3%	7.6%	7.8%	8.0%	8.2%	8.4%	8.6%	8.8%	9.0%	9.2%	
Growth Rate (%)		9.83	6.81	6.04	5.39	4.99	4.76	4.58	4.39	4.11	3.85	3.73	5.32
Commerce, management and	**d business administration**	166,869	171,251	175,055	178,318	181,316	184,301	187,338	190,412	193,293	195,956	198,685	
% of Total		36.9%	36.7%	36.6%	36.4%	36.3%	36.1%	36.0%	35.9%	35.7%	35.6%	35.5%	
Growth Rate (%)		3.31	2.63	2.22	1.86	1.68	1.65	1.65	1.64	1.51	1.38	1.39	1.90
Agricultural, biological, nutri	**itional, and food sciences**	19,777	20,290	20,739	21,127	21,487	21,849	22,219	22,595	22,949	23,278	23,615	
% of Total		4.4%	4.4%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.2%	4.2%	4.2%	
Growth Rate (%)		3.40	2.59	2.21	1.87	1.70	1.68	1.69	1.69	1.57	1.43	1.45	1.94
Engineering and applied sci	**ences**	884	888	890	891	891	891	891	891	890	889	888	
% of Total		0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)		0.68	0.45	0.23	0.11	0.00	0.00	0.00	0.00	-0.11	-0.11	-0.11	0.10
Applied science technologie	**s and trades**	41,297	43,347	45,282	47,097	48,860	50,622	52,392	54,166	55,895	57,570	59,253	
% of Total		9.1%	9.3%	9.5%	9.6%	9.8%	9.9%	10.1%	10.2%	10.3%	10.5%	10.6%	
Growth Rate (%)		6.38	4.96	4.46	4.01	3.74	3.61	3.50	3.39	3.19	3.00	2.92	3.92
Health professions and relat	**ted technologies**	96,801	98,998	100,914	102,612	104,219	105,858	107,556	109,306	110,994	112,605	114,275	
% of Total		21.4%	21.2%	21.1%	21.0%	20.9%	20.8%	20.7%	20.6%	20.5%	20.5%	20.4%	
Growth Rate (%)		2.83	2.27	1.94	1.68	1.57	1.57	1.60	1.63	1.54	1.45	1.48	1.78
Mathematics, computer and	**physical sciences**	3,387	3,388	3,380	3,365	3,346	3,327	3,308	3,291	3,270	3,247	3,225	
% of Total		0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.6%	0.6%	0.6%	0.6%	0.6%	
Growth Rate (%)		0.30	0.03	-0.24	-0.44	-0.56	-0.57	-0.57	-0.51	-0.64	-0.70	-0.68	-0.42
No specialization		1,627	1,641	1,653	1,663	1,672	1,681	1,692	1,704	1,714	1,725	1,735	
% of Total		0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	
Growth Rate (%)		0.93	0.86	0.73	0.60	0.54	0.54	0.65	0.71	0.59	0.64	0.58	0.67

Appendix C

Major Fields of Study: College and Trade (Cont.)

Males	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average, 2007-2017
Educational, recreational and counselling services	7,248	7,505	7,737	7,945	8,141	8,337	8,535	8,734	8,924	9,104	9,285	
% of Total	1.6%	1.6%	1.7%	1.7%	1.7%	1.7%	1.7%	1.8%	1.8%	1.8%	1.8%	
Growth Rate (%)	3.56	3.55	3.09	2.69	2.47	2.41	2.37	2.33	2.18	2.02	1.99	2.60
Fine and applied arts	16,738	17,104	17,407	17,652	17,869	18,085	18,305	18,528	18,730	18,908	19,093	
% of Total	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	
Growth Rate (%)	2.62	2.19	1.77	1.41	1.23	1.21	1.22	1.22	1.09	0.95	0.98	1.44
Humanities and related fields	11,731	12,205	12,631	13,005	13,354	13,699	14,045	14,392	14,718	15,022	15,329	
% of Total	2.6%	2.6%	2.7%	2.7%	2.8%	2.8%	2.9%	2.9%	2.9%	3.0%	3.0%	
Growth Rate (%)	5.05	4.04	3.49	2.96	2.68	2.58	2.53	2.47	2.27	2.07	2.04	2.93
Social sciences and related fields	18,148	19,195	20,167	21,069	21,937	22,803	23,672	24,542	25,383	26,190	27,005	
% of Total	4.0%	4.2%	4.3%	4.4%	4.6%	4.7%	4.8%	4.9%	5.1%	5.2%	5.3%	
Growth Rate (%)	6.48	5.77	5.06	4.47	4.12	3.95	3.81	3.68	3.43	3.18	3.11	4.28
Commerce, management and business administration	56,519	59,035	61,378	63,559	65,660	67,756	69,866	71,980	74,027	76,001	77,990	
% of Total	12.5%	12.8%	13.1%	13.4%	13.7%	14.0%	14.2%	14.5%	14.8%	15.0%	15.3%	
Growth Rate (%)	4.90	4.45	3.97	3.55	3.31	3.19	3.11	3.03	2.84	2.67	2.62	3.42
Agricultural, biological, nutritional, and food sciences	25,796	26,384	26,895	27,333	27,735	28,135	28,540	28,948	29,328	29,676	30,031	
% of Total	5.7%	5.7%	5.7%	5.8%	5.8%	5.8%	5.8%	5.8%	5.9%	5.9%	5.9%	
Growth Rate (%)	2.54	2.28	1.94	1.63	1.47	1.44	1.44	1.43	1.31	1.19	1.20	1.62
Engineering and applied sciences	2,473	2,506	2,531	2,549	2,562	2,574	2,586	2,597	2,606	2,611	2,616	
% of Total	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	
Growth Rate (%)	1.73	1.33	1.00	0.71	0.51	0.47	0.47	0.43	0.35	0.19	0.19	0.67
Applied science technologies and trades	293,523	296,838	299,158	300,560	301,483	302,355	303,286	304,247	304,870	305,119	305,468	
% of Total	64.9%	64.4%	63.9%	63.3%	62.8%	62.3%	61.8%	61.3%	60.8%	60.3%	59.9%	
Growth Rate (%)	1.48	1.13	0.78	0.47	0.31	0.29	0.31	0.32	0.20	0.08	0.11	0.50
Health professions and related technologies	15,248	15,519	15,782	16,040	16,306	16,595	16,909	17,244	17,583	17,922	18,281	
% of Total	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.5%	3.5%	3.5%	3.6%	
Growth Rate (%)	1.90	1.78	1.69	1.63	1.66	1.77	1.89	1.98	1.97	1.93	2.00	1.84
Mathematics, computer and physical sciences	2,972	2,970	2,960	2,944	2,924	2,903	2,883	2,863	2,841	2,817	2,793	
% of Total	0.7%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.5%	
Growth Rate (%)	0.17	-0.07	-0.34	-0.54	-0.68	-0.72	-0.69	-0.69	-0.77	-0.84	-0.85	-0.55
No specialization	1,745	1,810	1,874	1,936	1,996	2,058	2,119	2,182	2,243	2,303	2,363	
% of Total	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	
Growth Rate (%)	3.62	3.72	3.54	3.31	3.10	3.11	2.96	2.97	2.80	2.67	2.61	3.13

Appendix C

Major Fields of Study: University

Both Genders	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average, 2007-2017
Educational, recreational and counselling services	91,211	93,351	95,046	96,663	98,179	99,696	101,244	102,811	104,280	105,636	107,022	
% of Total	19.7%	19.4%	19.1%	18.8%	18.6%	18.3%	18.1%	17.9%	17.7%	17.5%	17.3%	
Growth Rate (%)	2.93	2.35	1.82	1.70	1.57	1.55	1.55	1.55	1.43	1.30	1.31	1.73
Fine and applied arts	11,620	12,205	12,731	13,225	13,704	14,185	14,669	15,156	15,627	16,078	16,531	
% of Total	2.5%	2.5%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.7%	2.7%	
Growth Rate (%)	5.68	5.03	4.31	3.88	3.62	3.51	3.41	3.32	3.11	2.89	2.82	3.78
Humanities and related fields	37,437	38,909	40,233	41,362	42,401	43,427	44,456	45,484	46,447	47,336	48,232	
% of Total	8.1%	8.1%	8.1%	8.1%	8.0%	8.0%	7.9%	7.9%	7.9%	7.8%	7.8%	
Growth Rate (%)	4.53	3.93	3.40	2.81	2.51	2.42	2.37	2.31	2.12	1.91	1.89	2.75
Social sciences and related fields	73,314	76,961	80,399	83,522	86,514	89,502	92,510	95,526	98,428	101,199	103,983	
% of Total	15.9%	16.0%	16.1%	16.3%	16.4%	16.4%	16.5%	16.6%	16.7%	16.8%	16.8%	
Growth Rate (%)	5.72	4.97	4.47	3.88	3.58	3.45	3.36	3.26	3.04	2.82	2.75	3.75
Commerce, management and business administration	82,441	87,356	91,861	96,204	100,494	104,800	109,140	113,498	117,750	121,877	126,016	
% of Total	17.8%	18.2%	18.4%	18.7%	19.0%	19.3%	19.5%	19.7%	20.0%	20.2%	20.4%	
Growth Rate (%)	6.93	5.96	5.16	4.73	4.46	4.28	4.14	3.99	3.75	3.50	3.40	4.57
Agricultural, biological, nutritional, and food sciences	24,281	25,381	26,340	27,212	28,056	28,903	29,758	30,617	31,447	32,244	33,044	
% of Total	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	
Growth Rate (%)	4.58	4.53	3.78	3.31	3.10	3.02	2.96	2.89	2.71	2.53	2.48	3.26
Engineering and applied sciences	55,588	57,763	59,792	61,687	63,521	65,351	67,184	69,013	70,784	72,490	74,190	
% of Total	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	
Growth Rate (%)	4.29	3.91	3.51	3.17	2.97	2.88	2.80	2.72	2.57	2.41	2.35	3.05
Applied science technologies and trades	1,259	1,278	1,290	1,296	1,299	1,301	1,303	1,305	1,306	1,303	1,301	
% of Total	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)	2.11	1.51	0.94	0.47	0.23	0.15	0.15	0.15	0.08	-0.23	-0.15	0.49
Health professions and related technologies	44,390	45,790	47,069	48,185	49,255	50,341	51,457	52,594	53,689	54,732	55,799	
% of Total	9.6%	9.5%	9.5%	9.4%	9.3%	9.3%	9.2%	9.1%	9.1%	9.1%	9.0%	
Growth Rate (%)	3.47	3.15	2.79	2.37	2.22	2.20	2.22	2.21	2.08	1.94	1.95	2.42
Mathematics, computer and physical sciences	38,698	40,045	41,314	42,463	43,562	44,657	45,760	46,863	47,922	48,929	49,939	
% of Total	8.4%	8.3%	8.3%	8.3%	8.2%	8.2%	8.2%	8.2%	8.1%	8.1%	8.1%	
Growth Rate (%)	3.97	3.48	3.17	2.78	2.59	2.51	2.47	2.41	2.26	2.10	2.06	2.71
No specialization	1,758	1,808	1,831	1,865	1,899	1,933	1,967	2,002	2,037	2,069	2,103	
% of Total	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	
Growth Rate (%)	3.05	2.84	1.27	1.86	1.82	1.79	1.76	1.78	1.75	1.57	1.64	1.92

Appendix C

Major Fields of Study: University (Cont.)

Females	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average, 2007-2017
Educational, recreational and counselling services	62,661	64,309	65,668	66,960	68,177	69,396	70,637	71,891	73,076	74,180	75,305	
% of Total	26.6%	26.0%	25.5%	25.0%	24.6%	24.2%	23.8%	23.5%	23.2%	22.8%	22.6%	
Growth Rate (%)	3.22	2.63	2.11	1.97	1.82	1.79	1.79	1.78	1.65	1.51	1.52	1.98
Fine and applied arts	7,915	8,344	8,729	9,094	9,449	9,806	10,167	10,530	10,883	11,222	11,563	
% of Total	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.5%	3.5%	
Growth Rate (%)	6.03	5.42	4.61	4.18	3.90	3.78	3.68	3.57	3.35	3.11	3.04	4.06
Humanities and related fields	21,591	22,638	23,583	24,417	25,197	25,967	26,738	27,507	28,234	28,916	29,601	
% of Total	9.2%	9.2%	9.2%	9.1%	9.1%	9.1%	9.0%	9.0%	8.9%	8.9%	8.9%	
Growth Rate (%)	5.56	4.85	4.17	3.54	3.19	3.06	2.97	2.88	2.64	2.42	2.37	3.42
Social sciences and related fields	39,820	42,234	44,564	46,714	48,797	50,882	52,982	55,088	57,133	59,105	61,084	
% of Total	16.9%	17.1%	17.3%	17.5%	17.6%	17.8%	17.9%	18.0%	18.1%	18.2%	18.3%	
Growth Rate (%)	6.9 .	6.06	5.52	4.82	4.46	4.27	4.13	3.97	3.71	3.45	3.35	4.61
Commerce, management and business administration	37,291	40,230	42,958	45,665	48,382	51,118	53,879	56,653	59,385	62,062	64,744	
% of Total	15.8%	16.3%	16.7%	17.1%	17.5%	17.8%	18.2%	18.5%	18.8%	19.1%	19.4%	
Growth Rate (%)	9.31	7.88	6.78	6.30	5.95	5.65	5.40	5.15	4.82	4.51	4.32	6.01
Agricultural, biological, nutritional, and food sciences	12,830	13,590	14,268	14,893	15,505	16,119	16,738	17,360	17,967	18,554	19,142	
% of Total	5.4%	5.5%	5.5%	5.6%	5.6%	5.6%	5.6%	5.7%	5.7%	5.7%	5.7%	
Growth Rate (%)	5.97	5.92	4.99	4.38	4.11	3.96	3.84	3.72	3.50	3.27	3.17	4.26
Engineering and applied sciences	7,900	8,484	9,039	9,584	10,127	10,670	11,216	11,761	12,296	12,820	13,342	
% of Total	3.4%	3.4%	3.5%	3.6%	3.7%	3.7%	3.8%	3.8%	3.9%	3.9%	4.0%	
Growth Rate (%)	8.47	7.39	6.54	6.03	5.67	5.36	5.12	4.86	4.55	4.26	4.07	5.67
Applied science technologies and trades	414	424	432	437	440	444	448	451	454	456	458	
% of Total	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	
Growth Rate (%)	3.24	2.42	1.89	1.16	0.69	0.91	0.90	0.67	0.67	0.44	0.44	1.22
Health professions and related technologies	32,409	33,464	34,428	35,270	36,081	36,906	37,755	38,623	39,460	40,259	41,078	
% of Total	13.8%	13.5%	13.4%	13.2%	13.0%	12.9%	12.7%	12.6%	12.5%	12.4%	12.3%	
Growth Rate (%)	3.55	3.26	2.88	2.45	2.30	2.29	2.30	2.30	2.17	2.02	2.03	2.50
Mathematics, computer and physical sciences	11,732	12,258	12,766	13,234	13,687	14,139	14,594	15,050	15,491	15,915	16,340	
% of Total	5.0%	5.0%	5.0%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	
Growth Rate (%)	5.09	4.48	4.14	3.67	3.42	3.30	3.22	3.12	2.93	2.74	2.67	3.53
No specialization	1,020	1,056	1,072	1,097	1,122	1,147	1,173	1,199	1,224	1,249	1,274	
% of Total	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	
Growth Rate (%)	3.76	3.53	1.52	2.33	2.28	2.23	2.27	2.22	2.09	2.04	2.00	2.39

Appendix C

Major Fields of Study: University (Cont.)

Males	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average, 2007-2017
Educational, recreational and counselling services	28,550	29,042	29,378	29,703	30,001	30,300	30,607	30,920	31,205	31,456	31,717	
% of Total	12.6%	12.4%	12.2%	12.1%	11.9%	11.8%	11.6%	11.5%	11.4%	11.3%	11.2%	
Growth Rate (%)	2.30	1.72	1.16	1.11	1.00	1.00	1.01	1.02	0.92	0.80	0.83	1.17
Fine and applied arts	3,705	3,860	4,002	4,132	4,255	4,378	4,502	4,626	4,744	4,856	4,968	
% of Total	1.6%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	
Growth Rate (%)	4.96	4.18	3.68	3.25	2.98	2.89	2.83	2.75	2.55	2.36	2.31	3.16
Humanities and related fields	15,845	16,271	16,649	16,945	17,204	17,460	17,718	17,978	18,212	18,419	18,631	
% of Total	7.0%	7.0%	6.9%	6.9%	6.8%	6.8%	6.7%	6.7%	6.6%	6.6%	6.6%	
Growth Rate (%)	3.15	2.69	2.32	1.78	1.53	1.49	1.48	1.47	1.30	1.14	1.15	1.77
Social sciences and related fields	33,494	34,727	35,835	36,808	37,717	38,619	39,528	40,438	41,295	42,094	42,899	
% of Total	14.8%	14.9%	14.9%	14.9%	15.0%	15.0%	15.0%	15.0%	15.1%	15.1%	15.1%	
Growth Rate (%)	4.33	3.68	3.19	2.72	2.47	2.39	2.35	2.30	2.12	1.93	1.91	2.67
Commerce, management and business administration	45,150	47,126	48,903	50,539	52,112	53,682	55,262	56,844	58,365	59,815	61,272	
% of Total	19.9%	20.2%	20.3%	20.5%	20.7%	20.8%	21.0%	21.2%	21.3%	21.4%	21.6%	
Growth Rate (%)	5.05	4.38	3.77	3.35	3.11	3.01	2.94	2.86	2.68	2.48	2.41	3.28
Agricultural, biological, nutritional, and food sciences	11,450	11,791	12,072	12,319	12,552	12,785	13,020	13,257	13,481	13,691	13,903	
% of Total	5.1%	5.0%	5.0%	5.0%	5.0%	5.0%	4.9%	4.9%	4.9%	4.9%	4.9%	
Growth Rate (%)	3.06	2.98	2.38	2.05	1.89	1.86	1.84	1.82	1.69	1.56	1.55	2.06
Engineering and applied sciences	47,688	49,279	50,754	52,103	53,395	54,680	55,969	57,253	58,488	59,670	60,848	
% of Total	21.1%	21.1%	21.1%	21.2%	21.2%	21.2%	21.3%	21.3%	21.3%	21.4%	21.4%	
Growth Rate (%)	3.63	3.34	2.99	2.66	2.48	2.41	2.36	2.29	2.16	2.02	1.97	2.57
Applied science technologies and trades	845	854	859	860	858	857	855	854	852	847	843	
% of Total	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	
Growth Rate (%)	1.56	1.07	0.59	0.12	-0.23	-0.12	-0.23	-0.12	-0.23	-0.59	-0.47	0.12
Health professions and related technologies	11,981	12,326	12,641	12,915	13,174	13,435	13,702	13,972	14,229	14,473	14,722	
% of Total	5.3%	5.3%	5.3%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	
Growth Rate (%)	3.24	2.88	2.56	2.17	2.01	1.98	1.99	1.97	1.84	1.71	1.72	2.19
Mathematics, computer and physical sciences	26,965	27,788	28,548	29,229	29,875	30,518	31,166	31,813	32,431	33,014	33,599	
% of Total	11.9%	11.9%	11.9%	11.9%	11.9%	11.9%	11.8%	11.8%	11.8%	11.8%	11.8%	
Growth Rate (%)	3.48	3.05	2.73	2.39	2.21	2.15	2.12	2.08	1.94	1.80	1.77	2.34
No specialization	737	752	759	768	777	785	794	804	812	820	829	
% of Total	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	
Growth Rate (%)	2.08	2.04	0.93	1.19	1.17	1.03	1.15	1.26	1.00	0.99	1.10	1.26